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ABSTRACT

The study examined the quality of educational research published in the journals, with a focus on the following: (1) an evaluation of the quality of contemporary published research from the standpoint of sound research conduct and reporting as judged by experts, and (2) an examination of the relationship between assigned quality ratings and selected characteristics of research articles and participation experts. A stratified random sample of the 1971 educational research articles was selected and a sample of judges to rate the articles was selected via the membership directory of American Educational Research Association (AERA). The results of the study provide consumers of research with needed information regarding the soundness of the research whose findings influence present-day decision making. (Author)

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Evaluation of Published Educational Research: A National Survey[1]

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Introduction

This study was designed to determine the quality of educational research articles published in educational journals and in journals of related professions. Published educational research is the delivery system by which professional educators acquire much of their understanding of today's educational problems. In this critical communicative process, the need for sound research yielding meaningful, interpretable information is imperative. Yet, considerable doubt has been raised as to the quality of published educational research and, therefore, as to the validity and significance of the data being provided educators via the research reported (Bloom, 1966; Michael, 1963; Scriven, 1960). The only recent comprehensive study of the quality of published educational research was carried out on a representative sample of 1962 research articles by an ad hoc Committee on Evaluation of Educational Research established by AERA (Wandt, 1967). That study found that a majority of research articles published in 1962 contained serious flaws. More disturbing, less than 7% of the research articles published in education journals were rated as being worthy of publication, and the quality of research published in education journals was found to be markedly inferior to that published in journals of related professions - primarily psychology.

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Numerous guidelines for evaluating educational research have appeared in the last 20 years, attesting to the need for informed, critical evaluation of the material appearing as research (e.g. Best, 1970; Borg, 1963; Dvorak, 1956; Farquhar & Krumboltz, 1959; Johnson, 1957; Kohr & Suydam, 1970; Strauss, 1969; Symond, 1956; Van Dalen, 1958; Miersma, 1969). However, empirical studies on the question of the quality of actual research have been almost non-existent. No follow-up of the 1962 work of the AERA Committee on Evaluation of Research has heretofore been undertaken.

The years since 1962 have brought many ostensible advances in educational research. Membership in AERA has grown tremendously since 1962; new journals have been established to publish educational research. Educational research is now recognized as a specialty in its own right, not simply a subspecialty of psychology. The years since 1962 have also been the years of federally funded projects in educational research and for programs with a mandate for "evaluation." A consideration of these changes led to the decision to replicate the earlier study.

Statement of the Problem

The purpose of the present study was to determine the quality of the current body of educational research published in journals. In examining the general question of quality of published educational research, the investigators focused on the following specific questions:

1. What per cent of the educational research articles published in journals are considered by experts in educational research to (1) merit publication without change, (2) need minor revision to make them acceptable for publication, (3) need major revision to make them acceptable for publication, (4) be so low in quality they should not have been published?

2. How do the experts rate representative educational research articles on specific characteristics related to the quality of research and of research reporting?

3. Is there a difference in quality, both overall and on the specific characteristics, between educational research articles published in (1) research - oriented education journals, (2) non-research oriented education journals, and (3) related profession journals?

4. What specific shortcomings are most frequently cited by experts to substantiate a judgment to reject or require major revisions in an article.

In order to compare the findings with those of a decade ago, the study was, insofar as feasible, a replication of the work of the Committee on Evaluation of Research (Wandt, 1967). Procedural departures from the earlier work were taken where necessary in an attempt to strengthen the research design. Some changes were also required because of changes over the decade in the population of journals, and reviewers. Many of the procedural changes were based on recommendations of the earlier investigators (Wandt, 1967) or inspired by difficulties that they encountered.

In addition to pursuing the basic questions posed above, the investigators also examined the influence of selected characteristics of the judges on assigned ratings.

Methodology

The sampling and data gathering procedures of the study were identical to those of the earlier study of the committee on Evaluation of Research except where specifically noted.

Selection of journals and articles.

The first task was the identification of the population of educational research articles and selection of a representative sample of the articles.

In the original study the following criteria were established for identifying journals publishing educational research: (1) They must have been indexed in Education Index and (2) They must have been cited 10 or more times in chapter bibliographies of the Review of Educational Research during the full three year cycle immediately preceding the year selected for study.

RER changed its editorial policy in the middle of 1970, so that the last full 3-year cycle was from mid-1967 to mid-1970. In the future, this may not be a useful criterion to use in a study of this kind. Perhaps citation in Encyclopedia of Educational Research or the Annual Review of Educational Research could be used.

Journals were classified as "Related Profession" (RP) if they were indexed in Ulrich's Periodicals Directory under the headings of psychology, sociology, and medical science. The remaining journals were classified as either "Educational, publishing primarily research" (ER) or "Educational, publishing primarily non-research" (NR) depending upon the per cent of articles (exclusive of reviews and comments) that were research.* The criterion for classification as "primarily research" was 51% or more of the articles devoted to research. The 1971 population of journals is reported in Table 1 and the population of journals for the 1962 study is in Appendix D.

In comparing the population of journals with that of the earlier study, the following changes were found:

(1) Fifty-seven journals met the selection criteria in 1962, only 46 met them for 1971. Nine journals in 1962 and two in 1971 had no research articles, leaving a population of 49 for 1962 and 44 for 1971.

(2) In 1962, only 5 journals were classified as "Educational, publishing primarily research." In 1971 there were 13 - a dramatic change. The number of NR journals decreased from 27 in 1962 to 22. There was no change in the number of RP journals.

(3) Several journals selected in 1971 were classified differently than in 1962: Three NR (1962) were ER in 1971; two ER (1962) were NR (1971) and one RP in 1962 became ER in 1971.

(4) Of journals added to the list, 6 were ER, 11 NR, and 4 RP; of those deleted, 1 was ER, 15 NR, and 3 RP.

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*The 1962 study used "percentage of total journal pages devoted to research."

One unanticipated difficulty from this objective process of selecting articles was that five articles from three "Related Profession" journals (American Journal of Mental Deficiency, Journal of Speech and Hearing Research, Journal of Speech and Hearing Disorders) were so technical in a non-educational specialty that the reviewers were unable to review them. For each such article, a replacement was randomly selected from the same journal. In future studies of this type, perhaps a criterion of "relevance to education" should be added to the selection criteria for the population of articles.

The sample was formed by stratifying the population of articles (N = 1486) by journal, and drawing an 8% sample of articles at random within each stratum (journal), thereby creating a proportionate stratified random sample of 121 articles. (See Table 1). The 121 articles are listed in Appendix C. The earlier study sampled from a population of 827 research articles. The 1486 research articles in the 1971 population represents a marked increase in number from a decade earlier, although the 1971 population is contained within fewer journals (44 as compared to 49),

Selection of Judges

Judges for the 1962 study were selected from the AERA directory on the basis of their "professional reputation in educational research methodology." The investigators in the present study decided to begin with a random sample of the members in Division D (Measurement and Research Methodology) of the 1971-72 AERA Directory. The first step was the selection of a 10% sample of the approximately 5000 regular members of Division D, selecting the first person randomly, then proceeding to select every 10th person in the directory. The approximately 500 Division D members selected were then sent reply cards inviting them to serve as judges. Of the 489 members who responded, 353 indicated a willingness to participate and supplied information about their background.

The judges in the original study were described as being selected on the basis of their professional reputation. Ninety-eight per cent held the doctorate, 63% had taught research courses, 75% had supervised a dissertation, and 78% had supervised a thesis. The median number of published articles was 16. The volunteers for the present study departed somewhat from the original group of judges as to these characteristics, so an attempt was made to select from the pool of volunteers a group which was as similar as possible to the original group of judges. After first being selected in regard to "earned doctor's degree" the volunteers were rank ordered as to "number of publications." An attempt was then made to select those with the greatest number of publications. The final criterion was supervision of theses and dissertations. Even with this deliberate selection, the present sample of judges has fewer publications and a little less research experience than judges for the earlier study, perhaps indicating that they are generally a younger group than those in the 1962 study. The final group of judges selected numbered 171; 121 to serve for the main rating study and 50 to serve in a reliability study of the ratings. The characteristics of the judges are reported in Table 2.

The great majority of judges in the earlier study (84%) were members of the American Psychological Association. A post hoc check of judges in the present study found only 44% to be members of APA. The judges are listed in Appendix B.

Assignment of Articles to Judges

One of the 121 articles to be evaluated was assigned at random and mailed to each of 121 judges drawn randomly from the total group of 171 judges. Following a recommendation in the earlier study, the investigators attempted to reduce bias on the part of the judges toward the articles by having all articles reproduced with the name of the journal and the names and addresses of the authors omitted. The remaining 50 judges were each randomly assigned

and mailed one of the 121 articles being evaluated by the larger group of judges. The pairs of ratings thereby derived on 50 of the 121 articles was the basis for a reliability study of the evaluative ratings. A check on the assignment process revealed that in no case did a judge receive an article of which he was an author.

At the time of this report, rating data had not been received on seven of the 121 articles. Any resulting bias is assumed to be minimal because the missing ratings are distributed across six different journals and all three journal categories. However, for the data analysis reported below, the missing ratings reduced the N of the basic study to 114 and the reliability N to 44.

The Evaluation Instrument

The evaluation instrument used was a modification of that devised by the Committee on Evaluation of Research (Wandt, 1967). It required three types of reactions to the article: (1) ratings on specific characteristics, (2) overall rating, and (3) justification of overall rating.

Each judge was asked to rate his assigned article in terms of 33 characteristics deemed desirable as aspects of quality in conducting and reporting research. For each characteristic, a five-point scale was used, representing five levels of quality:

Level of Quality	Description
5 - Excellent	A model of good practice
4 - Good	A few minor defects
3 - Mediocre	Not good, not bad
2 - Poor	Some serious defects
1 - Completely Incompetent	A horrible example

If a characteristic was not appropriate to the research study, the judge was asked to place an "X" by the characteristic.

The 33-item rating scale was an expansion of the 25-item scale used in the earlier study. The investigators added eight items to the original scale, two that were suggested by the earlier study and six that arose from the investigators' personal experience in research consumption. The 33-item scale was composed of seven subscales covering the following topics: (1) Title (2) Problem, (3) Review of Literature, (4) Procedures, (5) Data Analysis, (6) Summary and Conclusions, and (7) Form and Style. The rating scale is included as Appendix A.

Each judge was next asked to assume the role of editor of a journal that published educational research and to make one of four choices in regard to his assigned article: (1) accept as is for publication, (2) accept for publication after minor revisions, (3) accept only after major revisions, or (4) reject it. This 4-choice rating is hereafter referred to as the ARRR rating. Those judges who rated their assigned article as (3) or (4) were asked to indicate which of the 33 specific shortcomings they would cite to substantiate their judgment.

In the original study the judge had only three choices in his role as editor: (1) accept as is, (2) accept after minor revisions, or (3) reject. The earlier investigators found that many judges stretched category (2) to include major as well as minor revisions. Therefore, "accept after major revision" was added as an explicit category in the present study.

Interjudge Reliability of the Instrument

For 44 articles ratings were received from two judges. Inter-judge correlations were computed for all subscales, for the total scale, and for the ARRR ratings. These correlations, reported in Table 3, range from .11 for the 1-item scale of "Title" to .68 for the 5-item scale of "Review of the Literature". In addition, a check was made as to the extent of agreement between pairs of

judges on the ARRR scale. As Table 4 indicates, there were no cases in which an article rated "Reject" by one judge was rated "Accept as is" by the other and vice versa. There were only 9 cases (20%) in which the judges differed by two categories. Thirty per cent of the judgments were the same and an additional 50 per cent differed by only one category.

Internal Validation of the Instrument

Since there is no external criterion against which to validate the rating scale, an attempt was made to gauge the consistency of the ratings within the instrument. A total scale score was computed for each article, by adding the numerical values of the 33 ratings and dividing by the number of items rated.[2] Similarly, a mean rating was computed for each of the seven subscales of the rating scale. The internal consistency of the instrument was checked in two ways:

1. Computation of intercorrelations of all the subscales. (Presented in TABLE 5) Except for correlations with "Title", these ranged from .30 to .65. All intercorrelations were significant (df = 112) beyond the .005 alpha level.

2. Computation of the tetrachoric correlation between the total scale score and the ARRR rating, on which raters judged the article on a 4-point scale. The ARRR ratings were split so that categories 1 and 2 formed one group and categories 3 and 4 formed the other group. The r_t was .87 (df = 112) which is significant beyond the .005 alpha level.

From these analyses it was concluded that the rating scale was sufficiently consistent within itself to be useful in rating research articles.

Findings[3]

Before the data were analyzed, a check was made to see whether the characteristics of the judges were related to their ratings. It was found

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[2] The total scale score for some articles was based on somewhat less than 33 items because one or more items were marked "not applicable" by the judge.

[3] Findings of the 1962 study (Wandt, 1967) are reproduced in Appendix D. Appreciation is expressed to Edwin Wandt for granting permission to reproduce these findings.

that there was a tendency for non-APA members and less experienced judges (i.e. no research teaching, no dissertation supervision, no thesis supervision) to rate articles slightly higher than the more experienced judges did. However, it was also found that the reviewers with varying characteristics were quite well distributed among the three types of journals, so it was decided to ignore characteristics of judges in further analyses.

Overall Quality

The findings on the ARRR ratings for the 114 educational research articles for all journals, for all education journals, and across the three journal categories are summarized in Table 6.

For all journals, only 8% of research articles were rated "Acceptable as is for publication", 31% were rated "Acceptable after minor revisions", 34% were rated "Acceptable only after major revisions", and 27% were rated "Reject".

A chi-square analysis was made on the distribution of ARRR ratings across the three journal categories, ER, NR, and RP. A chi-square value of 2.50 was obtained (df = 6), which was non-significant. The distribution of ratings on overall quality was, therefore, interpreted to be comparable, regardless of the type of journal.

Ratings on the 33 Characteristics

The findings on 33 specific characteristics of the 114 educational research articles for all journals, for all education journals, and across the three journal categories are summarized in Table 7.

For all journals the highest mean rating was assigned to "Title is well related to content" (3.80) and the lowest was assigned to "Limitations of the study are stated" (2.37) followed closely by "Validity and reliability of data gathering procedures are established (2.43). No mean rating fell below 2.00 in any journal category and only one mean rating was at 4.00 or above. The

median rating was 3.26.

For all Education Journals the mean ratings ranged from 2.21 to 3.55, with a median of 3.00.

On the following characteristics, the assigned ratings were considerably below the median for all three journal categories: (1) Limitations of the study are stated, (2) Validity and reliability of data gathering procedures are established, (3) Studies are examined critically, (4) Assumptions are clearly stated, (5) Research design is free of specific weaknesses, and (6) Method of sampling is appropriate.

The following characteristics received ratings considerably above the median for all three journal categories: (1) Title is well related to article, (2) Problem is significant, (3) Source of important findings are noted, (4) Data gathering methods are described, (5) Conclusions are relevant to the problem, (6) Report is logically organized, and (7) Tone of the report displays an unbiased attitude. The mean ratings of the 33 characteristics for the articles in ER journals ranged from 2.19 to 3.60, with a median of 3.04. For the articles in NR journals, the mean ratings ranged from 2.16 to 3.76, with a median of 2.90. For the articles in the RP journals, the mean ratings ranged from 2.54 to 4.13, with a median of 3.45.

Ratings on the Subscales

The mean and standard deviations across the rating subscales are presented for the three journal categories and for all journals in Table 8a and the results of a Type 1 ANOVA for Subscales X Journal Categories are summarized in Table 8b.

The ANOVA was performed using Journal Category as a between-subjects variable composed of three levels (ER, NR, RP) and using Subscales as a within-subjects variable composed of seven levels (Title, Problem Statement, Review of Literature, Procedures, Data Analysis, Summary and Conclusions, and Form and Style). The ANOVA revealed a main effect on Journal Category

significant beyond the .001 alpha level and a main effect on subscales also significant beyond the .001 alpha level. There was no significant interaction between the two variables.

The post hoc analysis for the subscale means indicated that the difference between A (Title) and G (Form and style) is not significant, while the means for both of these scales differ from those for the other five subscales. The means of the other five subscales do not differ significantly from each other. For the journal categories, the post hoc analysis indicated that the mean for "Related Profession" journals is significantly higher than that for both categories of Education journals, but the difference between the means of the two categories of Education journals is not significant.

Specific Shortcomings Cited by Judges

Each judge who, in the role of editor, chose to reject his article or to accept only after major revisions was asked to indicate the specific shortcomings he would cite to substantiate his judgment. A tabulation of the resulting citations is presented in Table 9 for all journal articles and for articles in each of the three journal categories. For each characteristic Table 9 contains the frequency of citation and the rank within each journal category.

The 10 most frequently cited shortcomings of articles in All Journals in order of frequency and with per cent of articles affected were:

1. Research design is free of specific weaknesses (27%).
2. Research design is appropriate to solution of the problem (23%).
3. Validity and reliability of data gathering procedures are established (22%).
4. Conclusions are substantiated by the evidence presented (22%).
5. Methods of sampling are appropriate (21%).
6. Appropriate methods are selected to analyze data (21%).
7. Conclusions are significant (20%).
8. Limitations of the study are stated (19%).
9. Tables and figures are used correctly (18%).
10. Results of the analysis are presented clearly (16%).

The pattern of shortcomings in the total sample of articles was generally common across all three journal categories. A Kendall coefficient of concordance (W) computed on the three sets of ranking was found to be .71, indicating a significant ($p < .001$) relationship among the rankings across the three journal categories. Furthermore, seven of the 10 most frequently cited shortcomings in the All Journals category were also among the 10 most frequently cited in each of the three separate categories. However, disparities were apparent across the seven subscales of the rating instrument. Virtually all of the most frequently cited characteristics were contained within the following three subscales: (1) Procedures, (2) Data Analysis, and (3) Summary and Conclusions. Those characteristics relevant to Title, Problem, Review of Literature, and Form and Style were relatively free of frequent citations.

Limitations of the Study

The findings and conclusions of this study should be interpreted in light of the following limitations:

1. As in the original study, the articles were evaluated by judges who were considered expert in educational research but not necessarily in the specific area of the study which they evaluated. Matching specialty of the article to specialty of the judge might have produced somewhat different results.
2. The population of articles in the study was created using an arbitrary, though objective, operational definition of "educational research". Undoubtedly, a change in this definition would alter the population make-up and possible result in a population with characteristics different from the one in this study.
3. Generalizations from this study should be limited to articles published in the year 1971. Although it is reasonable to suggest that similar patterns may exist for articles published during other years, no evidence bearing on this point is at hand.
4. Although "blind" ratings were used, some judges may have recognized the source of the article, so that some degree of bias may have existed which is undetected.

Discussion and Conclusions

This survey of the quality of published educational research was a replication of a study conducted in 1962 by an ad hoc committee of AERA. Interpretation of the findings necessarily requires some comparisions with those of the earlier study. These comparisons must consider three variables: (1) The "true" quality of the articles, (2) The biases of the judges for or against a class of journals, and (3) The reference point or rating standard of the judges.

The real concern of the investigators was with the first variable, that is, the "true" quality of the research. However, all conclusions regarding the quality of the research must be tentative because the effects of the other two forces are unknown at the present time.

If the possible problems of judge bias and judge standards is ignored, the following conclusions may be drawn:

1. The percentage of published articles rated "reject" was lower for 1971 (27%) than for 1962 (40%), but the percentage rated "accept as is" is also lower (9% in 1971, 19% in 1962). These data are confounded by the change in the rating scale from a 3-point scale in 1962 to a 4-point scale in 1971. If the "Minor revisons" category for the 1971 study is collapsed with "Accept as is", then the percentage of acceptable articles is still only 39%.
2. The superiority of the "Related Profession" journals over "Education" journals is not as apparent in this study as it was in the 1962 study. There was no difference in the percentages of the four ARRR ratings assigned to each category of journals in this study. For the means of the ratings on the 33 specific characteristics, the difference between education and RP journals, although significant, is less pronounced than in 1962. The median of the item ratings for the two categories of education journals are very close to those for 1962, while that for RP journals is lower than for 1962 (3.45 for 1971, 3.92 for 1962).
3. The quality of published educational research is still mediocre. That is, the medians of the item ratings for all journal categories were approximately 3.0, defined in this study as "Mediocre, not good, not bad".
4. The greatest deficiencies of articles were in characteristics related to "procedures", "data analysis", and "summary and conclusions". The specific characteristics with the lowest ratings generally came from

these sections, as did the most frequently cited shortcomings. Although an open-ended procedure was used to identify shortcomings in the 1962 study while the present study used a structured response, it may be of interest to compare the ten specific deficiencies cited most frequently in both studies. Two of the deficiencies cited most frequently for 1971 articles were not included on the 1962 scale and were mentioned rather infrequently as deficiencies in that study. Five deficiencies were among the top 10 for both studies:

a. Validity and reliability of data gathering procedures are established
b. Conclusions are substantiated by the evidence presented
c. Methods of sampling are appropriate
d. Appropriate methods are used to analyze data
e. Results of the analysis are presented clearly.

All of these characteristics are critically important to consumers of research to assure proper interpretation of research findings.

The preceding conclusions are based on two assumptions. The first is that the judges in the present study used essentially the same standards of excellence as were used by the judges in 1962. This assumption is supported by the similarity of judge characteristics and the use of virtually identical procedures in defining and sampling articles and in gathering the rating data. The other assumption is that no biases for or against the various journal categories existed in either study. Since an attempt was made to remove this source of bias in the present study while it is an unknown for the earlier study, this assumption is more difficult to support. Since neither of these assumptions was tested, several alternative conclusions may be drawn.

1. Research published in RP journals may have declined in quality, while that published in educational journals has remained constant in quality. This would be the case if neither judge bias or changing standards were

operating in either study.

2. Research published in both educational journals and RP journals has remained constant in quality. This would be the case if judge standards remained constant and a selective bias favoring RP journals in the 1962 study was eliminated in the present study by the use of blind ratings.
3. The quality of research in RP journals may have remained constant and the quality for educational journals may have declined. This would be the case if there were bias on the judges' part in the earlier study in favor of the RP journals and against the educational journals, and if the ratings standards remained constant. If the blind ratings in the present study eliminated these biases, then the ratings obtained in the present study would appear to support this conclusion.
4. All published research may have improved in quality since 1962. This would be the case if judges' standards have been raised and if selective bias favoring RP journals but not negative toward educational journals operated in the 1962 study but not in this one.

In the absence of more information it is impossible to decide which is the most acceptable conclusion. Additional studies are required to resolve this question.

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Table 1

Population and Sample of Educational Research Articles Published in 1971

Journal	No. of Articles In Population	In Sample
Education Journals with Primarily Research Articles	555	45
1. AV Communications Review	15	1
2. American Educational Research Journal	35	3
3. British Journal of Educational Psychology	37	3
4. Counselor Education and Supervision	23	2
5. Educational and Psychological Measurement	40	3
6. Exceptional Children	58	5
7. Journal of College Student Personnel	59	5
8. Journal of Educational Measurement	30	2
9. Journal of Educational Research	81	6
10. Journal of Experimental Education	56	5
11. Journal of Negro Education	27	2
12. Journal of Research in Science Teaching	49	4
13. Psychology in the Schools	49	4
Education Journals with Primarily Non-Research Articles	260	21
1. *American Vocational Journal	6	-
2. *Arithmetic Teacher	2	-
3. *Audiovisual Instruction	4	-
4. Comparative Educational Review	9	1
5. Educational Leadership	14	1
6. Elementary School Journal	11	1
7. *Journal of Creative Behavior	2	-
8. Journal of School Health	26	2
9. Journal of School Psychology	31	2
10. Journal of Special Education	8	1
11. Journal of Teacher Education	19	2
12. *Mathematics Teacher	6	1
13. Personnel and Guidance Journal	7	1
14. *Phi Delta Kappan	4	-
15. School Counselor	15	1
16. *School Review	3	-
17. School Science and Mathematics	30	2
18. Science Education	30	2
19. *Science Teacher	4	1
20. *Teachers College Record	1	-
21. Vocational Guidance Quarterly	22	2
22. *Volta Review	4	1
Related Professions	667	55
1. American Journal of Mental Deficiency	109	9
2. American Journal of Orthopsychiatry	19	2
3. Child Development	120	10
4. Journal of Applied Psychology	94	8
5. Journal of Counseling Psychology	97	8
6. Journal of Educational Psychology	77	6
7. Journal of Speech and Hearing Disorder	38	3
8. Journal of Speech and Hearing Research	96	8
9. Sociology of Education	17	1
All Journals	1486	121

* Ten journals published less than 7 research articles each in 1971. The 38 articles from these journals were treated as a single group for purposes of sampling. A total of 3 articles were chosen from this group with the restriction that no more than one article could come from any given journal. As a result, 7 journals were excluded from the sample.

Table 2

Characteristics of the Sample of 171 AERA Division D Members

	Percent	Md	P_{10}	P_{90}
Has earned doctor's degree	100%			
Has taught course in methods of educational research	83%			
Has supervised doctoral dissertation	73%			
Has supervised master's thesis	80%			
Has served as a review editor of a journal	56%			
Member of APA	44%			
Years of "full time equivalent" research experience		6.00	2.13	19.00
Number of educational research articles published		10.05	3.81	48.10

TABLE 3

Interjudge Reliability Estimates for Subscale Scores, Total Scale Score, and ARRR Score for 44 Articles

Variable	r	Significance Level
Subscale Scores		
Title	.11	NS
Problem statement	.18	NS
Review of the literature	.68	.01
Procedures	.37	.05
Data analysis	.26	NS
Summary and conclusion	.17	NS
Form and style	.22	NS
Total Scale Score	.43	.01
ARRR Score	.21	NS

TABLE 4

Agreement of First and Second Judges
on ARRR Ratings for 44 Articles

		Rating of First Judge				
		Accept as is	Accept after Minor Revisions	Accept after Major Revisions	Reject	Totals
Rating of Second Judge	Reject		3	5	3	11
	Accept after Major Revisions	1	5	6	3	15
	Accept after Minor Revisions	1	3	7	3	14
	Accept as is	1	1	2		4
	Totals	3	12	21	9	44

Table 5

Intercorrelations of the

Subscales of the Rating Scale

	Subscales						
	A	B	C	D	E	F	G
A. Title							
B. Problem Statement	.29						
C. Literature Review	.15	.40					
D. Procedures	.28	.57	.37				
E. Data Analysis	.25	.49	.33	.65			
F. Summary, Conclusions	.22	.56	.30	.51	.56		
G. Form & Style	.27	.53	.45	.65	.58	.60	

Table 6

Accept - Revise (minor) - Revise (major) - Reject Ratings of 114 Educational Research Articles Published in 1971[1]

Source of the articles[2]	Number of articles in sample	Percent rated as							
		Accept as is		Minor revisions		Major revisions		Reject	
		n	%	n	%	n	%	n	%
All educational journals	63	4	(6)	18	(29)	24	(38)	17	(27)
Education journals which primarily publish research articles	42	3	(7)	14	(33)	14	(33)	11	(26)
Education journals which primarily publish non-research articles	21	1	(5)	4	(19)	10	(48)	6	(29)
Related profession journals	51	5	(10)	17	(33)	15	(29)	14	(28)
All journals	114	9	(8)	35	(31)	39	(34)	31	(27)

[1] χ^2 for distribution of ratings by journal categories = 2.50; df = 6; NS

[2] See Table 1 for journals in each category.

Table 7

Mean Ratings of 33 Characteristics of 114 Research Articles Published in 1971

Characteristic	Mean Rating: Education Journals Research	Education Journals Non Research	All Education Journals	Related-Profession Journals	All Journals
A. Title					
(1) Title is well related to content of article	3.60	3.45	3.55	4.13	3.80
B. Problem					
(2) Problem is clearly stated	3.49	2.95	3.31	3.80	3.54
(3) Hypotheses are clearly stated	2.90	2.75	2.84	2.93	2.88
(4) Problem is significant	3.26	3.38	3.31	3.78	3.52
(5) Assumptions are clearly stated	2.45	2.32	2.41	2.76	2.56
(6) Limitations of the study are stated	2.19	2.33	2.24	2.54	2.37
(7) Important terms are defined	2.94	2.70	2.86	2.36	2.86
C. Review of literature					
*(8) Coverage of the literature is adequate	3.05	2.80	2.97	3.62	3.27
*(9) Review of the literature is well organized	3.05	2.85	2.98	3.55	3.24
*(10) Studies are examined critically	2.24	2.16	2.21	2.94	2.55
*(11) Source of important findings is noted	3.18	3.16	3.18	3.84	3.48
(12) Relationship of the problem to previous research is made clear	3.03	3.00	3.02	3.62	3.39
D. Procedures					
(13) Research design is described fully	3.07	3.19	3.11	3.68	3.36
(14) Research design is appropriate to solution of the problem	2.98	2.71	2.89	3.44	3.14
(15) Research design is free of specific weaknesses	2.49	2.48	2.48	2.90	2.67
(16) Population and sample are described	3.02	3.24	3.10	3.67	3.35
(17) Method of sampling is appropriate	2.61	2.75	2.66	2.77	2.71

Table 7 Continued

Characteristic	Mean Rating: Education Journals Research	Education Journals Non Research	All Education Journals	Related-Profession Journals	All Journals
(18) Data gathering methods or procedures are described	3.10	3.24	3.15	3.84	3.46
(19) Data gathering methods or procedures are appropriate to the solution of the problem	2.95	2.95	2.95	3.42	3.15
(20) Data gathering methods or procedures are used correctly	3.14	3.30	3.19	3.58	3.37
(21) Validity & reliability of data gathering procedures are established	2.19	2.52	2.31	2.59	2.43
E. Data analysis					
(22) Appropriate methods are selected to analyze data	3.20	2.95	3.12	3.46	3.27
(23) Methods utilized in analyzing the data are applied correctly	3.24	2.80	3.09	3.78	3.41
(24) Results of the analysis are presented clearly	2.91	3.05	2.95	3.43	3.17
*(25) Tables and figures are effectively used	3.23	2.70	3.05	3.12	3.08
F. Summary & Conclusions					
(26) Conclusions are clearly stated	3.38	3.20	3.32	3.56	3.43
(27) Conclusions are substantiated by the evidence presented	3.02	2.80	2.95	3.08	3.01
*(28) Conclusions are relevant to the problem	3.50	3.21	3.41	3.71	3.55
*(29) Conclusions are significant	2.90	2.88	2.89	3.00	2.94
(30) Generalizations are confined to the population from which the sample was drawn	2.49	2.80	2.59	3.06	2.80

Table 7 Continued

Characteristic	Mean Rating: Education Journals Research	Education Journals Non Research	All Education Journals	Related-Profession Journals	All Journals
G. Form & Style					
(31) Report is clearly written	3.14	3.76	3.35	3.67	3.48
(32) Report is logically organized	3.32	3.43	3.36	3.80	3.56
(33) Tone of the report displays an unbiased, impartial, scientific attitude	3.29	3.43	3.33	3.82	3.55
Median	3.04	2.90	3.00	3.45	3.26

*Variables not in 1962 survey

Table 4

a. Means and Standard Deviations for Seven Subscales for Three Categories of Journals

Subscale	Type of Journal: Educ.-Research $\bar{X}$	Educ.-Research s	Educ.-Non-Research $\bar{X}$	Educ.-Non-Research s	Related Profession $\bar{X}$	Related Profession s	All Journals $\bar{X}$	All Journals s
A. Title	3.60	1.01	3.45	.95	4.13	1.00	3.80	1.03
B. Problem Statement	2.84	.76	2.77	.94	3.14	.75	2.96	.80
C. Review of Literature	2.88	1.04	2.72	1.10	3.53	.87	3.14	1.03
D. Procedures	2.86	.92	2.94	.91	3.34	.81	3.09	.89
E. Data Analysis	3.09	1.07	2.87	1.07	3.44	.90	3.21	1.01
F. Summary and Conclusions	3.08	.94	2.97	.74	3.31	.88	3.16	.84
G. Form and Style	3.25	.96	3.54	.93	3.78	.77	3.54	.90
GROUP MEANS AND S.D.'S	2.99	.73	2.94	.78	3.41	.62	3.17	.72

Table 8

b. Analysis of Variance for Seven Subscores and Three Categories of Journals

Source of Variation	Mean Square	df	F	Significance Level
Between Journal Categories (J)	19.11	2	6.10	<.001
ERROR	3.13	111		
Between Subscales (S)	7.96	6	13.95	<.001
Journal X Subscales	.73	12	1.27	NS
ERROR	.57	666		

Table 9

Number of Citations and Rank Order of Deficiencies of Journal Articles

Characteristic	All Journals		Education Research		Education Non Research		Related Profession	
	n	Rank Order	n	Rank Order	n	Rank Order	n	Rank Order
A. Title								
(1) Title is well related to content of article	6	33	2	32.5	2	25	2	30
B. Problem								
(2) Problem is clearly stated	13	19	3	30.5	6	2.5*	4	20
(3) Hypotheses are clearly stated	14	16.5	5	22	3	16	6	12.5
(4) Problem is significant	16	14.5	5	22	5	6*	6	12.5
(5) Assumptions are clearly stated	13	19	7	16.5	2	25	4	20
(6) Limitations of the study are stated	22	8*	9	11*	5	6*	8	8*
(7) Important terms are defined	11	23.5	3	30.5	3	16	5	15
C. Review of literature								
(8) Coverage of the literature is adequate	10	25.5	5	22	3	16	2	30
(9) Review of the literature is well organized	8	29.5	4	26.5	2	25	2	30
(10) Studies are examined critically	12	21.5	6	19	2	25	4	20
(11) Source of important findings are noted	7	21.5	2	32.5	2	25	3	26
(12) Relationship of the problem to previous research is made clear	11	23.5	4	26.5	4	10*	3	26
D. Procedures								
(13) Research design is described fully	17	12	10	6.5*	2	25	5	15
(14) Research design is appropriate to solution of the problem	26	2*	11	3.5*	7	1*	8	8*

*Indicates 10 most frequent citations for each category of journals

Table 9 Continued

Number of Citations and Rank Order of Deficiencies of Journal Articles

Characteristic	All Journals		Education Research		Education Non Research		Related Profession	
	n	Rank Order	n	Rank Order	n	Rank Order	n	Rank Order
(15) Research design is free of specific weaknesses	31	1*	12	1.5*	5	6*	14	1*
(16) Population and sample are described	16	14.5	9	11*	3	16	4	20
(17) Method of sampling is appropriate	24	5.5*	12	1.5*	3	16	9	5*
(18) Data gathering methods or procedures are described	13	19	6	19	3	16	4	20
(19) Data gathering methods or procedures are appropriate to the solution of the problem	17	12	8	14.5	2	25	7	10.5*
(20) Data gathering methods or procedures are used correctly	12	21.5	6	19	2	25	4	20
(21) Validity & reliability of data gathering procedures are established	25	3.5*	11	3.5*	4	10*	10	2.5*
E. Data analysis								
(22) Appropriate methods are selected to analyze data	24	5.5*	10	6.5*	5	6*	9	5*
(23) Methods utilized in analyzing the data are applied correctly	14	16.5	9	11*	2	25	3	26
(24) Results of the analysis are presented clearly	18	10*	10	6.5*	3	16	5	15
(25) Tables and figures are effectively used	21	9*	8	14.5	4	10*	9	5*
F. Summary & Conclusions								
(26) Conclusions are clearly stated	10	25.5	4	26.5	3	16	3	26

*Indicates 10 most frequent citations for each category of journals

Table 9 Continued

Number of Citations and Rank Order of Deficiencies of Journal Articles

Characteristic	All Journals		Education Research		Education Non Research		Related Profession	
	n	Rank Order	n	Rank Order	n	Rank Order	n	Rank Order
(27) Conclusions are substantiated by the evidence presented	25	3.5*	10	6.5*	5	6*	10	2.5*
(28) Conclusions are relevant to the problem	8	29.5	4	26.5	3	16	1	32.5
(29) Conclusions are significatn	23	7*	9	11*	6	2.5*	8	8*
(30) Generalizations are confined to the population from which the sample was drawn	17	12	9	11*	1	31	7	10.5*
G. Form & Style								
(31) Report is clearly written	9	21.5	4	26.5	1	31	4	20
(32) Report is logically organized	7	31.5	4	26.5	0	33	3	26
(33) Tone of the report displays an unbiased, impartial, scientific attitude	9	27.5	7	16.5	1	31	1	32.5

*Indicates 10 most frequent citations for each category of journals.

I. Evaluation of Specific Characteristics

A. Title

(1) Title is well related to content of article

B. Problem:

(2) Problem is clearly stated
(3) Hypotheses are clearly stated
(4) Problem is significant
(5) Assumptions are clearly stated
(6) Limitations of the study are stated
(7) Important terms are defined

C. Review of literature

(8) Coverage of the literature is adequate
(9) Review of the literature is well organized
(10) Studies are examined critically
(11) Source of important findings are noted
(12) Relationship of the problem to previous research is made clear

D. Procedures

(13) Research design is described fully
(14) Research design is appropriate to solution of the problem
(15) Research design is free of specific weaknesses
(16) Population and sample are described
(17) Method of sampling is appropriate
(18) Data gathering methods or procedures are described
(19) Data gathering methods or procedures are appropriate to the solution of the problem
(20) Data gathering methods or procedures are used correctly
(21) Validity & reliability of data gathering procedures are established

E. Data analysis

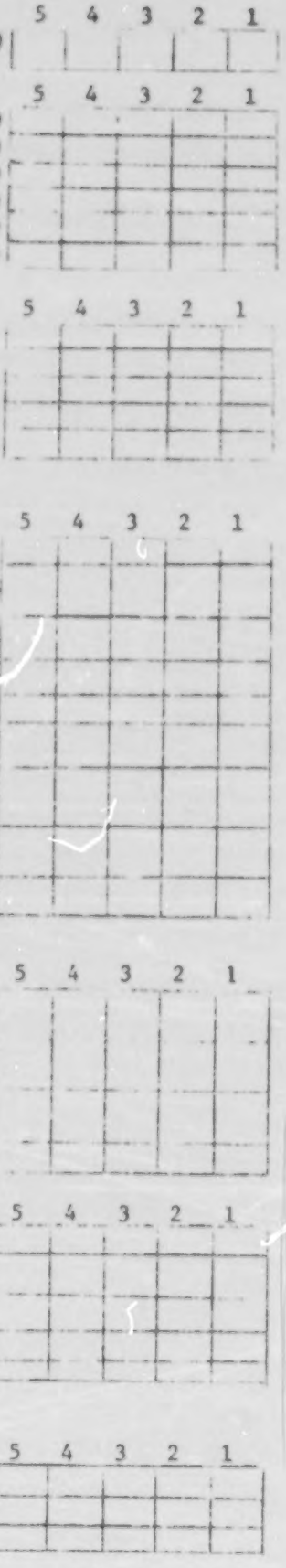
(22) Appropriate methods are selected to analyze data
(23) Methods utilized in analyzing the data are applied correctly
(24) Results of the analysis are presented clearly
(25) Tables and figures are effectively used

F. Summary & Conclusions

(26) Conclusions are clearly stated
(27) Conclusions are substantiated by the evidence presented
(28) Conclusions are relevant to the problem
(29) Conclusions are significant
(30) Generalizations are confined to the population from which the sample was drawn

G. Form & Style

(31) Report is clearly written
(32) Report is logically organized
(33) Tone of the report displays an urbiased, impartial, scientific attitude



II. Overall Evaluation (check one)

_____(1) Accept as is

_____(2) Accept after minor revisions

_____(3) Accept after major revisions

_____(4) Reject

(7) Important terms are defined (7)

C. Review of literature

		5	4	3	2	1
(8)	Coverage of the literature is adequate	(8)				
(9)	Review of the literature is well organized	(9)				
(10)	Studies are examined critically	(10)				
(11)	Source of important findings are noted	(11)				
(12)	Relationship of the problem to previous research is made clear	(12)				

D. Procedures

		5	4	3	2	1
(13)	Research design is described fully	(13)				
(14)	Research design is appropriate to solution of the problem	(14)				
(15)	Research design is free of specific weaknesses	(15)				
(16)	Population and sample are described	(16)				
(17)	Method of sampling is appropriate	(17)				
(18)	Data gathering methods or procedures are described	(18)				
(19)	Data gathering methods or procedures are appropriate to the solution of the problem	(19)				
(20)	Data gathering methods or procedures are used correctly	(20)				
(21)	Validity & reliability of data gathering procedures are established	(21)				

E. Data analysis

		5	4	3	2	1
(22)	Appropriate methods are selected to analyze data	(22)				
(23)	Methods utilized in analyzing the data are applied correctly	(23)				
(24)	Results of the analysis are presented clearly	(24)				
(25)	Tables and figures are effectively used	(25)				

F. Summary & Conclusions

		5	4	3	2	1
(26)	Conclusions are clearly stated	(26)				
(27)	Conclusions are substantiated by the evidence presented	(27)				
(28)	Conclusions are relevant to the problem	(28)				
(29)	Conclusions are significant	(29)				
(30)	Generalizations are confined to the population from which the sample was drawn	(30)				

G. Form & Style

		5	4	3	2	1
(31)	Report is clearly written	(31)				
(32)	Report is logically organized	(32)				
(33)	Tone of the report displays an urbiased, impartial, scientific attitude	(33)				

II. Overall Evaluation (check one)

_____(1) Accept as is

_____(2) Accept after minor revisions

_____(3) Accept after major revisions

_____(4) Reject

III. Specific Shortcomings

If decision on Part II was to reject or to accept after major revisions, circle the number of each specific shortcoming listed under Part I that you would cite to substantiate your judgment.

Description of the Population of Research Articles

The criteria used were those of the AERA Committee on Evaluation of Educational Research. An article was classified as research if it contained (1) a statement of the problem, (2) the presentation of data (not necessarily quantitative data), (3) an analysis of these data, and (4) a statement of conclusions. To delimit the journals to be searched for educational research studies, the following criteria were used: (1) the journal must be indexed in the Education Index, and (2) it must be cited 10 or more times in the Review of Educational Research during the three year period, 1968-70.

Directions on use of the Evaluation Sheet

I. Evaluation of Specific Characteristics

Assume the role of a professor of educational research methods who wants to develop a series of product scales illustrating five quality levels for each of 33 characteristics of a research article. Using the five-point rating scale below (representing five quality levels of a product scale), rate your research article in terms of each of the 33 characteristics on the Evaluation Sheet by placing a check (✓) in the appropriate box on the right.

Level of Quality	Description
5 - Excellent	A model of good practice
4 - Good	A few minor defects
3 - Mediocre	Not good, not bad
2 - Poor	Some serious defects
1 - Completely Incompetent	A horrible example

If the characteristic is not appropriate to the study, place an "X" in the margin at the extreme right of that characteristic.

II. Overall Evaluation

Assume the role of an editor of a journal that publishes educational research; assume that your research article had been submitted to you and that you must make one of four choices: (1) accept it as it is and publish it, (2) ask for minor revisions and publish it if the revisions are made, (3) ask for major revisions and publish it if the revisions are made, or (4) reject it. Under part II of the Evaluation Sheet, place a check (✓) in the appropriate space to indicate your decision.

The criteria used were those of the AERA Committee on Evaluation of Educational Research. An article was classified as research if it contained (1) a statement of the problem, (2) the presentation of data (not necessarily quantitative data), (3) an analysis of these data, and (4) a statement of conclusions. To delimit the journals to be searched for educational research studies, the following criteria were used: (1) the journal must be indexed in the Education Index, and (2) it must be cited 10 or more times in the Review of Educational Research during the three year period, 1968-70.

Directions on use of the Evaluation Sheet

I. Evaluation of Specific Characteristics

Assume the role of a professor of educational research methods who wants to develop a series of product scales illustrating five quality levels for each of 33 characteristics of a research article. Using the five-point rating scale below (representing five quality levels of a product scale), rate your research article in terms of each of the 33 characteristics on the Evaluation Sheet by placing a check (✓) in the appropriate box on the right.

Level of Quality	Description
5 - Excellent	A model of good practice
4 - Good	A few minor defects
3 - Mediocre	Not good, not bad
2 - Poor	Some serious defects
1 - Completely Incompetent	A horrible example

If the characteristic is not appropriate to the study, place an "X" in the margin at the extreme right of that characteristic.

II. Overall Evaluation

Assume the role of an editor of a journal that publishes educational research; assume that your research article had been submitted to you and that you must make one of four choices: (1) accept it as it is and publish it, (2) ask for minor revisions and publish it if the revisions are made, (3) ask for major revisions and publish it if the revisions are made, or (4) reject it. Under part II of the Evaluation Sheet, place a check (✓) in the appropriate space to indicate your decision.

III. Specific Shortcomings

(See part III of the Evaluation Sheet)

APPENDIX I

JUDGES OF THE ARTICLES

Airasian, Peter W.
Aleamoni, Lawrence M.
Allender, Jerome J.
Anderson, Thomas H.
Ashburn, Arnold C.
Beard, Jacob G.
Bergan, John
Binder, Dorothy M.
Bisbey, Gerald D.
Boykin, Leander L.
Brainard, Edward
Braskamp, Larry A.
Bronzaft, Arline L.
Busse, Thomas V.
Capobianco, Rudolph J.
Cartwright, G. Phillip
Cellura, A. Raymond
Ching, Doris C.
Chase, Clinton I.
Cody, John J.
Cohen, S. Alan
Cooper, James G.
Counelis, James Steve
Craig, Robert C.
Crouse, James H.
Delaney, Creighton H.
Dessart, Donald J.
Diamond, Esther E.
Doppelt, Jerome E.
Drawbaugh, Chalres C.
Drumheller, Sidney J.
Ernhart, Claire B.
Fox, A.H.
Feldmesser, Robert A.
Ferguson, Edward T., Jr.
Fleming, Juanita W.
Finger, John A., Jr.
Frantz, Thomas T.
Fredrick, Wayne C.
Fremer, John J., Jr.
Frye, Charles H.
Furst, Edward J.
Gadzella, Bernadette N.
Gerberich, J. Raymond
Goldstein, Leo S.
Gordon, Garford G.
Graybeal, William S.
Greene, Bert I.
Gunderson, Doris V.
Gwaltney, Thomas H., Jr.
Halperin Silas
Hamilton, Jean F.
Harshman, Hardwick W.
Hatch, Evelyn
Hayes, Robert B.
Hill, Richard
Hjelm, Howard F.
Hoetker, James
Hogan, Martin J.
Hoyt, Donald P.
Hutton, Jack G., Jr.
Johnson, Stuart R.
Jones, John G.
Jones, Richard R.
Jones, Worth R.
Karas, Shawky F.
Karnes, John W.
Kay, Patricia M.
Khatena, Joe
Kingston, Albert J.
Kirkland, Marjorie C.
Klaus, David J.
Knapp, Thomas R.
Kropp, Russell P.
Kurfeerst, Marvin
Lohman, Maurice A.
Lannholm, Gerald V.
Lashinger, Donald R.
Linderman, Richard H.
Liba, Marie R.
Lonsway, Francis A.
Loveless, Eugene J.
Lucow, William H.
Maccia, George S.
Madaus, George F.
Manion, Raymond C.
Martorella, P.H.
Mason, Geoffrey P.
McDavid, John W.
McLaughlin, G.W.
Metzner, Seymour
Miller, C. Dean
Miskel, Cecil
Moores, Donald F.
Montgomery, M. A. Patricia
Musella, Donald
Nagel, Elwyn H.
Nemzer, Claude L.
Olmsted, Patricia P.
Pallone, Nathaniel J.
Parsey, John H.
Pellemi, Anthony J.
Peters, Donald L.
Petrick, Beatrice
Pigge, Fred L.
Powell, J.C.
Rabinowitz, William
Razik, Taher
Rebelsky, Freda
Reilly, Robert R.
Resvick, Joseph
Rider, Gerald
Rodgers, William A.
Rosenshine, Barak
Ross, Sherman
Rotter, George
Ruscoe, Gordon C.
Schwirian, Patricia M.
Schnitzen, Joseph F.
Seibel, Dean W.
Sellman, Wayne S.
Senter, Donald R.
Salvia, John
Shann, Mary H.
Shavelson, Richard J.
Sheridan, Alton
Shalski, John M.
Sloane, Howard N., Jr.
Smith, Roulette Am.
Stallings, William M.
Steele, Joe M.
Stewin, Leonard L.
Stordahl, Kalmer
Stodolsky, Susan
Stratton, R. Paul
Svenson, Esther J.
Terranova, Carmelo
Thompson, George G.
Thorndike, Robert L.
Torrance, E. Paul
Trites, Lucy Zaccaria
Trosky, Odarka S.
Tully, C. Emerson
Tyler, Louise L.
Vetter, Louise
Vivekananthan, P.S.
Walker, Laurence A.
Ward, George II
Ward, Levis B.
Warren, Jonathan R.
Wasik, J. L.
Watson, J. Allen
Welch, Wayne W.
Wexler, Norman
Wiersma, William
Willingham, Warren
Wittrock, Merlin C.
Young, James C.
Zoll, Edward J.

APPENDIX C

Sample of 121 Articles - 1971

1. Althoff, Sally A., M.Ed., and Mussel, Edward J., Ed.D. "Social Class Trends in the Practices and Attitudes of College Students Regarding Sex, Smoking, Drinking, and the Use of Drugs." Journal of School Health XLI:390-394; September 1971.

2. Anderson, Gary J. "Effects of Course Content and Teacher Sex on the Social Climate of Learning." American Educational Research Journal 8:649-664; November 1971.

3. Anderson, Susan C., and Apostal, Robert A. "Occupational Introversion-Extroversion and Size of Hometown." The Vocational Guidance Quarterly 20:138-141; December 1971.

4. Aspy, David N. "Toward a Technology Which Helps Teachers Humanize Their Classrooms." Educational Leadership 28:626-632; March 1971.

5. Atwood, Ronald K. "Development of a Cognitive Preference Examination Utilizing General Science and Social Science Content." Journal of Research in Science Teaching 8:273-276, Issue 3, 1971.

6. Baker, Eva L. "Reinforcers for Teacher Behavior Reported in Cued and Uncued Situations." Journal of Teacher Education 22:205-209; Summer 1971.

7. Baker, Frank. "Measures of Ego Identity: A Multitrait-Multimethod Validation." Educational and Psychological Measurement 31:165-174; Spring, 1971.

8. Baldwin, Thomas S., and Bailey, Larry J. "Readability of Technical Training Materials Presented on Microfiche versus Offset Copy." Journal of Applied Psychology 55:37-41; February 1[illegible].

9. Baller, William. "Teacher Methodology and Transfer Potential in Language Arts Instruction." Journal of Experimental Education 40.1-5; Fall 1971.

10. Balow, Bruce; Fulton, Helen; Peploe, Ella. "Reading Comprehension Skills Among Hearing Impaired Adolescents." The Volta Review 73:113-119; February 1971.

11. Bart, W. M. "The Factor Structure of Formal Operations." The British Journal of Educational Psychology 41:70-77; 1971.

12. Beane, William E., and Lemke, Elmer A. "Group Variables Influencing the Transfer of Conceptual Behavior." Journal of Educational Psychology 62:215-218; June 1971.

13. Berman, Phyllis W., and Villwock, Mary Ann. "Response Latency: Errors and Subsequent Change of Response on Retest." Journal of Educational Psychology 62.474-481; December 1971.

14. Berry, Franklin M., and Baumeister, Alfred A. "Cue Selection and Meaningfulness in the Paired-Associates Learning of Retardates." American Journal of Mental Deficiency 75:456-462; January 1971.

15. Bloch, Ellin L., and Goodstein, Leonard D. "Functional Speech Disorders and Personality: A Decade of Research." Journal of Speech and Hearing Disorders 36:295-314; August 1971.

16. Bohn, Martin J., Jr. "Psychological Needs of Engineering, Pre-Law, Pre-Medical, and Undecided College Freshmen." Journal of College Student Personnel 12:359-361; September 1971.

17. Bohrnstedt, George W.; Lambert, Philip; Borgatta, Edgar F. "The Reliability and Validity of Quick Tests with High School Seniors." Journal of Experimental Education 39:22-23; Summer 1971.

18. Brackbill, Yvonne. "Cumulative Effects of Continuous Stimulation on Arousal Level in Infants." Child Development 42:17-26; March 1971.

19. Bruce, Larry R. A Study of the Relationship between the SCIS Teachers' Attitude Toward the Teacher-Student Relationship and Question Types." Journal of Research in Science Teaching 8:157-164; Issue 2, 1971.

20. Callahan, Walter J. "Adolescent Attitudes toward Mathematics." The Mathematics Teacher 64:751-755; December 1971.

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APPENDIX D TABLE 1D

The Population and Sample of Educational Research Articles Published in 1962

Journal	No. of articles In population	In sample
Education journals which publish primarily research articles	248	37
1. Journal of Educational Research	88	13
2. Personnel and Guidance Journal	60	9
3. Science Education	46	7
4. Journal of Experimental Education	32	5
5. California Journal of Educational Research	22	3
Education journals which publish primarily non-research articles	281	44
1. Bulletin of the National Association of Secondary School Principals	24	4
2. Elementary School Journal	23	3
3. Audio-Visual Communications Review	21	3
4. Arithmetic Teacher	20	3
5. Exceptional Children	15	2
6. Journal of Teacher Education	15	2
7. Elementary English	13	2
8. Vocational Guidance Quarterly	13	2
9. Journal of Negro Education	12	2
10. Junior College Journal	12	2
11. Adult Education	11	2
12. Clearing House	11	2
13. School Review	10	2
14. Education	9	1
15. School Science and Mathematics	9	1
16. High School Journal	8	1
17. NEA Research Bulletin	8	1
18. Volta Review	8	1
19. Journal of Research in Music Education	7	1
20. Quarterly Journal of Speech	6	1
21. School and Society	6	1
22. Journal of Higher Education	4	1
23. Science Teacher	4	1
24. Educational Record	3	1
25. Phi Delta Kappan	3	1
26. Religious Education	3	1
*27. Modern Language Journal	3	0
Related-Profession journals	298	44
1. Child Development	76	11
2. Journal of Educational Psychology	50	8
3. Educational and Psychological Measurement	42	6
4. Journal of Counseling Psychology	35	5
5. Journal of Personality	30	5
6. American Journal of Mental Deficiency	29	4
7. Journal of Speech and Hearing Disorders	22	3
8. Journal of Educational Sociology	11	2
*9. American Annals of the Deaf	3	0
All journals included in evaluation of research	827	125

*Five journals published only 3 research articles each in 1962. The 15 articles from these journals were treated as a single group for purposes of sampling. Only 3 articles were chosen from this group with the restriction that a journal could be represented by only one article. As a result of this sampling, two journals were excluded; 125 articles from 39 journals were included in the evaluation study.

Table 2D

Ratings on 25 Characteristics for 125 Research Articles (1962)

	Characteristics (listed in order of mean rating)	Mean	SD	N
24*	Report is logically organized	3.71	1.12	123
25	Tone of the report displays an unbiased, impartial scientific attitude	3.69	1.13	120
1	Problem is clearly stated	3.62	1.17	122
3	Problem is significant	3.59	1.09	121
13	Data-gathering methods or procedures are described	3.50	1.19	121
18	Methods utilized in analyzing the data are applied correctly	3.49	1.16	112
23	Report is clearly written	3.46	1.13	124
19	Results of the analysis are presented clearly	3.44	1.24	123
20	Conclusions are clearly stated	3.44	1.21	123
15	Data-gathering methods or procedures are utilized correctly	3.38	1.17	115
8	Research design is described fully	3.35	1.25	121
11	Population and sample are described	3.35	1.22	120
14	Data-gathering methods or procedures are appropriate to the solution of the problem	3.27	1.09	119
22	Generalizations are confined to the population from which the sample was drawn	3.26	1.22	111
2	Hypotheses are clearly stated	3.24	1.38	92
17	Appropriate methods are selected to analyze the data	3.24	1.23	119
6	Important terms are defined	3.16	1.23	101
7	Relationship of the problem to previous research is made clear	3.13	1.42	119
21	Conclusions are substantiated by the evidence presented	3.11	1.42	119
9	Research design is appropriate to solution of the problem	3.03	1.26	113
12	Method of sampling is appropriate	2.97	1.21	103
10	Research design is free of specific weaknesses	2.81	1.13	117
5	Limitations of the study are stated	2.74	1.24	118
16	Validity and reliability of the evidence gathered are established	2.74	1.30	107
4	Assumptions are clearly stated	2.73	1.25	108

*These numbers refer to scales or characteristics rated and can be used to refer to data in Table 3D

Table 3D

Ratings on 25 Characteristics for Four Categories of Journals (1962)

Characteristics	Related-profession journals (44 Articles)			Education journals (81 Articles)				Education journals (research) (37 Articles)			Education journals (non-research) (44 Articles)			
	M	SD	N	M	SD	N	t	M	SD	N	M	SD	N	t
1	4.00	1.02	44	3.41	1.18	78	2.75**	3.47	1.26	36	3.36	1.11	42	.42
2	3.53	1.21	38	3.04	1.44	54	1.69	3.12	1.51	26	2.96	1.43	28	.38
3	4.09	.88	43	3.31	1.08	78	4.03**	3.38	1.10	37	3.24	1.05	41	.54
4	3.30	1.14	40	2.40	1.18	68	3.85**	2.53	1.24	34	2.26	1.09	34	.92
5	3.33	1.17	42	2.41	1.15	76	4.13**	2.35	1.14	37	2.46	1.15	39	.41
6	3.67	1.05	39	2.84	1.22	62	3.47**	2.79	1.20	33	2.90	1.26	29	-.34
7	4.02	1.25	44	2.60	1.21	75	6.06**	2.68	1.16	37	2.53	1.25	38	.53
8	3.93	1.13	43	3.03	1.19	78	4.05**	3.30	1.14	37	2.76	1.18	41	1.94
9	3.67	1.19	42	2.65	1.13	71	4.51**	2.79	1.09	33	2.53	1.14	38	.97
10	3.50	1.10	42	2.42	1.04	75	5.22**	2.63	1.02	35	2.25	1.02	40	1.59
11	3.67	1.25	42	3.18	1.16	78	2.12*	3.54	1.10	35	2.88	1.12	43	2.56*
12	3.23	1.04	35	2.85	1.26	73	1.53	2.79	1.23	34	2.90	1.28	39	-.35
13	4.14	.93	43	3.14	1.16	78	4.30**	3.35	1.12	37	2.95	1.17	41	1.52
14	3.77	1.03	43	2.99	1.01	76	4.00**	3.17	.90	36	2.82	1.07	40	1.48
15	4.02	.96	42	3.01	1.10	73	4.30**	3.19	.95	32	2.88	1.19	41	1.18
16	3.18	1.28	39	2.49	1.37	68	2.56*	2.72	1.39	29	2.31	1.34	39	1.24
17	3.98	1.02	43	2.83	1.22	76	5.18**	3.14	1.13	36	2.55	1.22	40	2.14*
18	4.12	1.07	42	3.11	1.02	70	4.90**	3.26	.88	34	2.97	1.12	36	1.19
19	4.02	1.12	44	3.11	1.18	79	4.14**	3.48	1.13	35	2.82	1.13	44	2.57*
20	4.11	.96	44	3.06	1.16	79	5.06**	3.28	1.02	36	2.88	1.24	43	1.50
21	3.95	1.18	43	2.63	1.32	76	5.41**	2.91	1.34	34	2.40	1.25	42	1.67
22	3.67	1.05	36	3.07	1.24	75	2.48*	3.20	1.18	34	2.95	1.27	41	.88
23	3.91	1.10	44	3.21	1.06	80	3.43**	3.19	1.13	36	3.23	1.00	44	-.19
24	4.16	1.09	44	3.46	1.05	79	3.48**	3.53	1.09	36	3.40	1.01	43	.55
254.19	4.19	.95	43	3.42	1.12	77	3.78**	3.67	.97	36	3.20	1.19	41	1.86

*Significant at the .05 level.
**Significant at the .01 level.

TABLE 4D

Accept-Revise-Reject Ratings for 125 Research Articles (1962)

	Source of articles									
	All journals		Related-Profession journals		Education journals		Education journals (research)		Education journals (non-research)	
Number of articles	125		44		81		37		44	
Number of articles with ARR ratings of:										
Accept	24	(19%)	18	(41%)	6	(7%)	2	(5%)	4	(9%)
Revise	51	(41%)	18	(41%)	33	(41%)	18	(49%)	15	(34%)
Reject	50	(40%)	8	(18%)	42	(52%)	17	(46%)	25	(57%)
			$\chi^2 = 24.75$, 2df, $p<.01$				$\chi^2 = .96$, 1df**			
Mean* ARR ratings	1.79		2.23		1.56		1.59		1.52	
SD for ARR ratings	.74		.73		.63		.59		.66	
Difference of Means					.67 ($t = 5.33$, $p<.01$)				.07 ($t = .51$)	

*As a basis for computing mean ratings, the three alternatives of this forced-choice question were treated as a three-point rating scale, with numberical ratings of 3, 2, and 1 being assigned to responses summarized under the terms "Accept", "Revise", and "Reject".

**Because of the small N's in the accept category, the accept and revise categories were combined.